

What is claimed is:

1. A redundancy control circuit comprising:

a plurality of program elements, in which a defect address indicating a position of a defect is programmed  
5 by a dielectric breakdown due to applying of a voltage;  
and

a voltage control section which applies said voltage to part of a plurality of targeted program elements simultaneously,

10       Wherein said plurality of targeted program elements is part of said plurality of program element to be dielectrically broken down correspondingly to said defect address.

15 2. The redundancy control circuit according to claim 1, wherein a number of said part of the plurality of targeted program elements, of which number is less than a number of said plurality of program elements, is one, and

20       said voltage control section applies said voltage to each of said plurality of targeted program elements, one by one.

3. The redundancy control circuit according to claim  
25       1, wherein said voltage control section applies said voltage to said plurality of targeted program

elements, at a timing of a trigger signal.

4. The redundancy control circuit according to claim  
1, wherein said voltage control section commonly applies  
5 said voltage to said plurality of targeted program elements,  
and

said voltage is a voltage generated inside a device  
including said redundancy control circuit.

10 5. The redundancy control circuit according to claim  
1, wherein said voltage control section includes:

a timing setting section which outputs a timing  
signal indicating a timing for carrying out a dielectric  
breakdown of each of said plurality of program elements  
15 based on a trigger signal, and

a plurality of element breakdown sections, each of  
which is installed correspondingly to said each of the  
plurality of program elements and applies said voltage to  
corresponding one of said plurality of program elements  
20 based on said timing signal and said defect address.

6. The redundancy control circuit according to claim  
5, wherein each of said plurality of element breakdown  
sections includes:

25 a fuse breakdown setting section which applies a  
specifying signal at a timing of said timing signal based

on said defect address, wherein said specifying signal indicates whether or not said corresponding one of the plurality of program elements should be dielectrically broken down, and

5        a voltage applying section which applies said voltage to said corresponding one of the plurality of program elements in responses to said specifying signal, when said specifying signal indicates that said corresponding one of the plurality of program elements  
10 should be dielectrically broken down.

7.        The redundancy control circuit according to claim 6, wherein a first timing is different from a second timing, said first timing is a timing when a first said fuse  
15 breakdown setting section for a first one of said plurality of program elements, outputs a first said specifying signal, and

      said second timing is a timing when a second said fuse breakdown setting section for a second one of said  
20 plurality of program elements, outputs a second said specifying signal.

8.        The redundancy control circuit according to claim 7, further comprise:

25        a comparing section which compares said voltage with a standard voltage and outputs a comparing result signal,

wherein said timing setting section generates said second timing based on said trigger signal and said comparing result signal indicating that said voltage exceeds said standard voltage, after said voltage applying  
5 section supplies said voltage in responses to said first specifying signal supplied at said first timing.

9. The redundancy control circuit according to claim 8, wherein said timing setting section includes:

10 a first counter, which starts counting a first pulse number of said trigger signal when said first pulse number is M, and outputs a first control signal when counted said first pulse number is N,

a second counter, which starts counting a second  
15 pulse number of said trigger signal when said second pulse number is  $(M+N)$ , and outputs a second control signal when counted said second pulse number is N, and

a third counter, which starts counting a third pulse number of said trigger signal when said third pulse number  
20 is  $(M+2 \times N)$ , and outputs a third control signal when counted said third pulse number is N,

said first counter includes a first logical section which outputs a first said timing signal indicative of a timing when said first specifying signal is outputted,  
25 based on an inversion signal of said second control signal and said first control signal, and

said second counter includes a second logical section which outputs a second timing signal indicative of a timing when said second specifying signal is outputted, based on an inversion signal of said third control signal  
5 and said second control signal.

10. The redundancy control circuit according to claims 1, wherein said program element is an anti-fuse.

10 11. A semiconductor memory, comprising:

a redundancy control circuit which includes:

a plurality of program elements, in which a defect address indicating a position of a defect is programmed by a dielectric breakdown due to applying of  
15 a voltage, and

a voltage control section which applies said voltage to part of a plurality of targeted program elements simultaneously,

Wherein said plurality of targeted program  
20 elements is part of said plurality of program element to be dielectrically broken down correspondingly to said defect address;

one of a redundancy word line and a redundancy bit line which is replaced from one of a defective word line  
25 and a defective bit line corresponding to said defect address; and

a plurality of redundancy memory cells which is connected to one of said redundancy word line and said redundancy bit line.

5 12. The semiconductor memory according to claim 11, wherein a number of said part of the plurality of targeted program elements, of which number is less than a number of said plurality of program elements, is one, and

said voltage control section applies said voltage  
10 to each of said plurality of targeted program elements, one by one.

13. The semiconductor memory according to claim 11, wherein said voltage control section applies said  
15 voltage to said plurality of targeted program elements, at a timing of a trigger signal.

14. The semiconductor memory according to claim 11, wherein said voltage control section commonly applies said  
20 voltage to said plurality of targeted program elements, and

said voltage is a voltage generated inside a device including said redundancy control circuit.

25 15. The semiconductor memory according to claim 11, wherein said voltage control section includes:

a timing setting section which outputs a timing signal indicating a timing for carrying out a dielectric breakdown of each of said plurality of program elements based on a trigger signal, and

5 a plurality of element breakdown sections, each of which is installed correspondingly to said each of the plurality of program elements and applies said voltage to corresponding one of said plurality of program elements based on said timing signal and said defect address.

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16. The semiconductor memory according to claim 15, wherein each of said plurality of element breakdown sections includes:

a fuse breakdown setting section which applies a  
15 specifying signal at a timing of said timing signal based on said defect address, wherein said specifying signal indicates whether or not said corresponding one of the plurality of program elements should be dielectrically broken down, and

20 a voltage applying section which applies said voltage to said corresponding one of the plurality of program elements in responses to said specifying signal, when said specifying signal indicates that said corresponding one of the plurality of program elements  
25 should be dielectrically broken down.

17. The semiconductor memory according to claim 16,  
wherein a first timing is different from a second timing,  
said first timing is a timing when a first said fuse  
breakdown setting section for a first one of said plurality  
5 of program elements, outputs a first said specifying signal,  
and

said second timing is a timing when a second said  
fuse breakdown setting section for a second one of said  
plurality of program elements, outputs a second said  
10 specifying signal.

18. The semiconductor memory according to claim 17,  
further comprise:

a comparing section which compares said voltage with  
15 a standard voltage and outputs a comparing result signal,  
wherein said timing setting section generates said  
second timing based on said trigger signal and said  
comparing result signal indicating that said voltage  
exceeds said standard voltage, after said voltage applying  
20 section supplies said voltage in responses to said first  
specifying signal supplied at said first timing.

19. The semiconductor memory according to claim 18,  
wherein said timing setting section includes:

25 a first counter, which starts counting a first pulse  
number of said trigger signal when said first pulse number



is M, and outputs a first control signal when counted said first pulse number is N,

a second counter, which starts counting a second pulse number of said trigger signal when said second pulse  
5 number is (M+N), and outputs a second control signal when counted said second pulse number is N, and

a third counter, which starts counting a third pulse number of said trigger signal when said third pulse number is (M+2xN), and outputs a third control signal when counted  
10 said third pulse number is N,

said first counter includes a first logical section which outputs a first said timing signal indicative of a timing when said first specifying signal is outputted, based on an inversion signal of said second control signal  
15 and said first control signal, and

said second counter includes a second logical section which outputs a second timing signal indicative of a timing when said second specifying signal is outputted, based on an inversion signal of said third control signal  
20 and said second control signal.

20. The semiconductor memory according to claims 11, wherein said program element is an anti-fuse.

25 21. The semiconductor memory according to claim 11, wherein said semiconductor memory is DRAM, and

said program element has the same structure as a  
capacitor of a memory cell of said DRAM.